X. "On the Specific Resistance of Mercury." By R. T. GLAZEBROOK, M.A., F.R.S., Fellow of Trinity College, and T. C. FITZPATRICK, B.A., Fellow of Christ's College, Demonstrators in the Cavendish Laboratory, Cambridge. Received June 19, 1888.

(Abstract.)

The paper contains an account of experiments made to determine the value of the resistance of a column of mercury, 1 metre long and 1 sq. mm. in cross section, in terms of the B.A. unit. The method employed differed very slightly from that of Lord Rayleigh and Mrs. Sidgwick ('Phil. Trans.,' 1883). Tubes of about 1, 2, and 3 sq. mm. in cross section were calibrated and filled with mercury. They were then immersed in melting ice, and their resistance compared with that of the B.A. standards, using Carey Foster's method and the B.A. bridge. The length of the mercury column, occupying nearly the whole of the tube, was measured, and the mass of the same determined. From this the average cross section is obtained, and hence the value of $r$, the resistance of a column 1 metre long, 1 sq. mm. in cross section. The mercury used to find the cross section was with few exceptions that which had been employed in finding the resistance. The results of the measurements are given in Table I.

In the table, Column 1 gives the number of the tube, Column 2 the number of the observation. L is the length of the tube, and $a$ the mean radius of the cross section, R the observed resistance in B.A. units. The mean value of $r$ found from the three 1 mm. tubes is 0·95354 B.A. units. The other four tubes of one-half and one-third units respectively lead to the value $r = 0·95344$ B.A. units. The difference between the two is considerable, and reasons are given for assigning more weight to the first value.

For an account of the experiments and of the small precautions necessary to secure accuracy, reference must be made to the paper.

Table II gives a list of the various values which have been found for $r$ with the lengths of the column of mercury which, according to the different observers, has a resistance of 1 ohm ($10^9$ C.G.S. units of resistance). In combining our own observations we have assigned weights to the various tubes inversely proportional to their diameters, and we find as our final value

$$r = 0·95352.$$

Table I.

| No. of Tube. | | L. | $a$. | R. | $r$. | Mean value of $r$ from each tube. |
|---|---|---|---|---|---|---|
| VI. .............. | 1. | 113·134 | 0·0586 | 1·000010 | 0·95358 | |
| | 2. | " | " | 0·999949 | 0·95364 | |
| | 3. | " | " | 0·999949 | 0·95353 | |
| | 5. | " | " | 0·999915 | 0·95351 | 0·95357 |
| | 6. | " | " | 0·999982 | 0·95357 | |
| | 8. | " | " | 0·999955 | 0·95360 | |
| VIII.............. | 1. | 127·438 | 0·0622 | 1·000133 | 0·95351 | |
| | 2. | " | " | 1·000103 | 0·95349 | |
| | 3. | " | " | 0·999996 | 0·95353 | 0·95354 |
| | 5. | " | " | 1·000040 | 0·95357 | |
| | 7. | " | " | 1·000036 | 0·95361 | |
| II................ | 1. | 101·904 | 0·0553 | 1·011926 | 0·95353 | |
| | 2. | " | " | 1·011805 | 0·95340 | 0·95349 |
| | 3. | " | " | 1·011810 | 0·95356 | |
| | 4. | " | " | 1·011803 | 0·95346 | |
| V. .............. | 1. | 112·950 | 0·0829 | 0·499233 | 0·95334 | 0·95338 |
| | 2. | " | " | 0·499215 | 0·95342 | |
| IX. .............. | 1. | 110·913 | 0·0820 | 0·500388 | 0·95344 | 0·95344 |
| | 2. | " | " | 0·500333 | 0·95343 | |
| I................ | 1. | 91·723 | 0·0915 | 0·332535 | 0·95343 | 0·95344 |
| | 3. | " | " | 0·332574 | 0·95346 | |
| III.............. | 1. | 101·765 | 0·0968 | 0·329854 | 0·95345 | 0·95351 |
| | 2. | " | " | 0·329867 | 0·95357 | |

Table II.

| Observer. | Date. | Value for $r$ in B.A. units. | Value of ohm in centimetres of mercury at 0°. |
|---|---|---|---|
| Lord Rayleigh and Mrs. Sidgwick .... | 1883 | 0·95412 | 106·23 |
| Mascart, Nerville, and Benoit........ | 1884 | 0·95374 | 106·33 |
| Strecker.......................... | 1885 | 0·95334 | .. |
| L. Lorentz......................... | 1885 | 0·95388 | 105·93 |
| Rowland.......................... | 1887 | 0·95349 | 106·32 |
| Kohlrausch ...................... | 1888 | 0·95331 | 106·32 |
| Glazebrook and Fitzpatrick.......... | 1888 | 0·95352 | 106·29 |

The paper contains a discussion of the above results. It is shown that probably Lord Rayleigh's value of $r$ may be too high by as much as 0·0002, in consequence of the fact that the mercury in his terminal cups was 5° or 6° C., but no complete explanation of the differences between his result and those of Rowland, Kohlrausch, and ourselves, has been found. The difficulty of working with tubes such as those used by the Lorentz, 1—2 metres in length, and 1, 2, and 3 cm. in diameter, may perhaps account for his value for the ohm, viz., 105·93.

## XI. "Researches on the Structure, Organisation, and Classification of the Fossil Reptilia. VI. On the Anomodont Reptilia and their Allies." By H. G. SEELEY, F.R.S. Received June 20, 1888.

(Abstract.)

The author examines the structure of the skull in the Dicynodontia, and discusses the interpretations of its elements and affinities given by Sir Richard Owen, Professor Huxley, and Professor Cope, and arrives at the conclusion that the interpretation of the bones of the palate may be varied. The quadrate bone is found, though it is absent from many specimens owing to loose articulation, and the malleus is recognised as a normal element in the skull, which articulates with the quadrate and is free, except at its extremities. The palatine bones are internal to the pterygoids, and the pterygoids extend forward to the maxillary. The columella is found in more than one specimen. Many new specimens are described which further elucidate the structure of the skull. The first of these shows that the upper part of the foramen magnum is formed